PHILLIPS ACADEMY, ANDOVER, MASSACHUSETTS
DEPARTMENT OF ARCHAEOLOGY

BULLETIN V

Certain Peculiar Earthworks Near Andover, Massachusetts

By WARREN K. MOOREHEAD, Curator

PRICE 40 CENTS (POSTPAID)

ANDOVER, MASS.
THE ANDOVER PRESS
1912

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PLAN 1. "LOCATION OF THE EARTHWORKS."

HORACE HALE SMITH,
ENGINEER, ANDOVER.

0 1 2 3 4 5
MILES

INTRODUCTION

I desire to thank all those who coöperated in the preparation of this BULLETIN, or permitted us to measure the embankments on their lands.

I am particularly indebted to Mr. James C. Graham of Phillips Academy for discovering several of the places herein described, and for the interest he has manifested in our researches. Professor Allen R. Benner has my thanks for his discovery of the earthwork on the north side of the Shawsheen. Also to Professor Henry Haynes of Boston and Mr. C. C. Willoughby, Assistant Curator of the Peabody Museum, Harvard, I am under obligations. These two gentlemen visited two or three of the earthworks.

The larger part of Fort Graham belongs to Mr. Patrick Larkin of Boston and this land is leased by Mr. Freeman Abbott. Both Messrs. Larkin and Abbott permitted some preliminary excavations, surveying and photographing.

Mr. Percival Dove owns part of Fort Graham and we are also indebted to him and to Mrs. E. H. Stickney, another owner, for permission to carry on investigations.

Not only to all of these persons but also to Mr. William Perkins, the heirs of W. G. Goldsmith, to the Baker estate and Mr. E. R. Fraser we are indebted for permission to examine the works known as Fort Goldsmith and Haggett's Pond.

It was impossible to learn the names of owners of the various small camps along the Shawsheen except Mr. Pierson, Mr. Mr. Edward Poor, Mr. Moses Hill, and Messrs. Hoffman and Burtt. There are several lots the proprietors of which are unknown to us. However we are indebted to all of these people.

The surveying was done by a corps under the direction of Mr. H. H. Smith, C. E., and the photography by Mr. L. D. Sherman.

CERTAIN PECULIAR EARTHWORKS NEAR ANDOVER, MASSACHUSETTS

Shortly after the Department of Archaeology was established at Phillips Academy, Andover, Massachusetts, my attention was called to an embankment and ditch on the edge of Haggett's pond, West Parish, Andover. This is distant about three miles north-west from the town of Andover. Within a short time Mr. W. G. Goldsmith reported a similar embankment on his estate near the Reading road, about two miles south of Andover. Both of these places were examined by me and thought to be Indian, but to make certain I asked that able archaeologist, Mr. C. C. Willoughby of the Peabody Museum of Harvard University to inspect with me these two places. Mr. Willoughby did so.

Something over a year ago Mr. James C. Graham, head of the Scientific Department of our Academy, stated to me that he had found a curious embankment near Foster's Pond, two and one-half miles south-west from Andover. Mr. Graham and I visited this place together on several occasions and I came to the conclusion that the long embankment known as Fort Graham is of Indian origin.

Since the discovery of Fort Graham, we have found four separate works of similar character; two flanking the Shawsheen river just west of Lowell Junction, and extending half a mile up that stream. Another, near the east side of Foster's Pond. This one was also discovered by Mr. Graham. A third lying between the latter earthwork and Fort Goldsmith.

I am indebted to Mr. Graham for the following paragraphs concerning the formation and geology of the earthworks.

"The geology of the region has already been made familiar by the writings of Professor G. Frederick Wright and others on the glacial formations of eastern Massachusetts.* Huge outcrops of coarse granite are interspersed with sandy plains and kames, the latter in many cases being beautifully typical. It is in the sand and gravel of these kames that most of the

---

* *The Ice Age in North America.* By George Frederick Wright. 5th Edition, Oberlin, 1911.

Chapter 14, page 339. Kames. Speaks of Indian Ridge.

Chapter 20, page 572. Date of the Glacial Period. Speaks concerning kettle-hole, at Pomp's Pond.

Historical Sketches of Andover, (comprising the present towns of North Andover and Andover) *Massachusetts,* by Sarah Loring Bailey. Boston, 1880.

The Introduction, *"Prehistoric Andover,"* 8 pages, XVII to and including XXIV, was written by Professor G. F. Wright and deals with the geology of Andover.

FIG. 1—THE DITCH AND WALL OF HAGGETT'S POND WORK—LOOKING NORTH

trenches have been made, they yielding most easily to the digging implements of the prehistoric Indians. In the case of Fort Goldsmith the fortification runs for some distance along the very top of a steep, sandy kame. The north and south line of Fort Graham runs for the most part through sand and gravel lying at the foot of a granite outcrop, between it and the sandy plain through which the outlet of Foster's Pond flows. At one place on this line the trench does not follow what may be called the front of the hill but leaves a slight elevation between the fort and the plain. Investigation showed this elevation to be due to a mass of granite lying near the surface. Cutting through the granite was impossible for the Indians and hence the line of fortification was brought back to where the surface was more yielding. It is at this point, behind the line, that there occurs one of the circular structures, possibly built to strengthen this weak point in the defence in somewhat the same way that a turret is used to strengthen the vulnerable point of a wall. These circular structures are certainly not of glacial origin as the ridges of sand and gravel around the depressions show plainly that the sand was removed from the center making the depression, and thrown out making the ridge: and in making a section of the ridge it is quite easy to see where the original sod-line was.

"The east and west line of Fort Graham runs entirely through rather fine sand except at its eastern end where it is in lower and swampier ground. The trench along the Shawsheen is partly in the coarser material left by the erosion of the river, though much of it is in the sand."

That seven supposedly Indian works should exist in this long-settled part of New England, and not have been previously described by some one of the many persons who have during the past three centuries been interested in matters pertaining to Indians, is quite surprising. Yet so far as I can ascertain, no reference has been made to these interesting and extensive works. If they have been previously observed, or accounts of them have been published, of course I stand corrected.

There are similar embankments two miles north of the village of Millis, which lies about 25 miles northwest of Boston. These have been known for some time and are to be described by Mr. C. C. Willoughby in the "American Anthropologist."

Of the seven works near Andover, a preliminary examination

has been made by our Department. Mr. H. H. Smith, a Civil Engineer, was employed by us to survey all of them carefully and to make maps, which are reproduced in this pamphlet.

There was also considerable excavating carried on by three or four men under our direction at various points in the ditches, the walls, and near the embankments at two or three of the places. While these excavations are not productive of great results, yet they tend to confirm the opinion that the five earthworks were not constructed by early white colonists, but are the works of the Indians. Why the Indians should have constructed these small embankments in such peculiar locations, I leave for others to decide.

The wall at Haggett's Pond would seem to mark the site of a stockade or fortified village for obvious reasons, but the other works do not seem to have been built around villages, for the very good reason that there are no quantities of chips, broken implements, spalls, burnt stone or anything else denoting Indian occupation. At Millis there are numerous chips, spalls, etc. and the Millis works may have protected a village. As to this, I cannot speak until Mr. Willoughby's paper is published.

I walked over the Millis embankments in order to compare them with our seven forts. If they are of Indian origin, the ones near Andover certainly are. There is little difference in height of wall or depth of ditch. Perhaps the total length of walls at Millis exceeds those of Fort Graham, yet the sum of the embankments near Andover surpasses those at Millis. The main wall at Millis is on the side of a hill, the ditch uppermost — exactly as at Forts Shawsheen and Goldsmith.

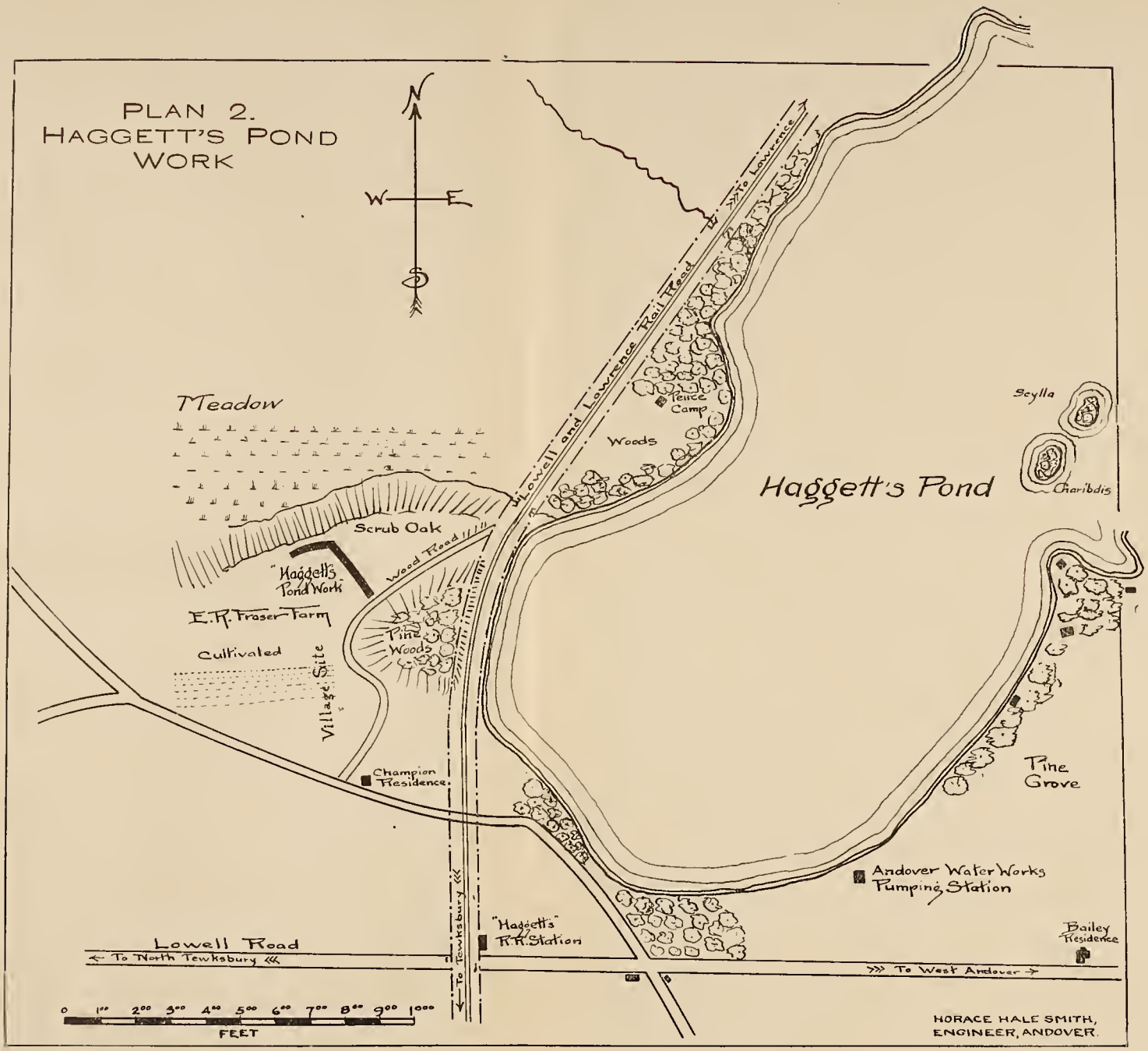
We may be sufficiently optimistic to believe that a future and thorough exploration of these various places will solve the problem of their construction. Certain it is, that much can be learned after more time is spent in their study.

Our object in publishing a preliminary report is to call attention to these works and to procure, if possible, information of other and similar earthworks to be found in New England. For it appears likely that there are other places of this character in Massachusetts if not throughout New England. I have already heard of a similar work in Maine. Correspondence is desired with any persons who can give us information regarding embankments and trenches of the sort herein described.

FIG. 2—THE DITCH AND WALL OF HAGGETT'S POND WORK—LOOKING EAST

Boy Standing in Ditch

FIG 3 — WALL OF FORT GRAHAM NEAR STATION 5—LOOKING WEST, TOWARDS THE FLAT


PLAN 2.
HAGGETT'S POND
WORK
N
W
E
S
Meadow
Scrub Oak
Wood Road
"Haggett's Pond Work"
E.R. Fraser Farm
Cultivated
Village Site
Champion Residence
Pine Woods
Lowell and Lawrence Rail Road
To Lawrence
Peirce Camp
Woods
Haggett's Pond
Scylla
Charibdis
Pine Grove
Andover Water Works Pumping Station
Bailey Residence
"Haggetts" R.R. Station
To Tewksbury
Lowell Road
To North Tewksbury
To West Andover
0 1⁰⁰ 2⁰⁰ 3⁰⁰ 4⁰⁰ 5⁰⁰ 6⁰⁰ 7⁰⁰ 8⁰⁰ 9⁰⁰ 1000
FEET
HORACE HALE SMITH,
ENGINEER, ANDOVER.

THE HAGGETT'S POND EMBANKMENT

This lies on an elevation at the west end of Haggett's Pond and some forty feet above the water and is on the farm of Mr. E. R. Fraser. The terrace on which it is situated is quite flat, although about one quarter of a mile to the west there is a long, prominent hill. The flat plain is composed of sandy soil, and numerous arrow points, burnt stone, chips and spalls have been picked up at various times.

Mr. John Follansbee, living near Haggett's Pond, who for many years collected specimens, accumulated several hundred implements, a large part of which came from this site. At the present day, in spite of extensive "relic hunting" on the part of collectors from Lowell and Lawrence, there are still to be seen numerous chips, flakes and spalls. The embankment can be traced for 300 feet, and at the present time it is something like two feet in elevation at the highest, and one foot at the lowest points.

Mr. Willoughby was of the opinion that it was a part of an Indian stockade. He based his conclusions upon examination of the site.

The ditch is on the side farthest from the pond. From the original bottom of the ditch to the top of the embankment is some three to four feet, although at certain points the ditch is not so deep.

Within the trench, upon the embankment and upon the eastern or pond side, are numerous large, old growth stumps. On the opposite side (west) there are no large stumps, and the growth is manifestly of recent origin. The land a few hundred feet to the west has been long under cultivation. The ends of the trench and embankment are not quite obliterated, and enough remains to indicate that at these points they turned abruptly to the west, and continuing, formed originally the northern and southern boundary of the fort or stockaded village. The engineer, Mr. Smith, traces the wing walls about 150 feet west. Mr. Willoughby concluded that the present embankment is all that remains of an enclosure which surrounded an Indian town, the northern, southern, and western embankments having

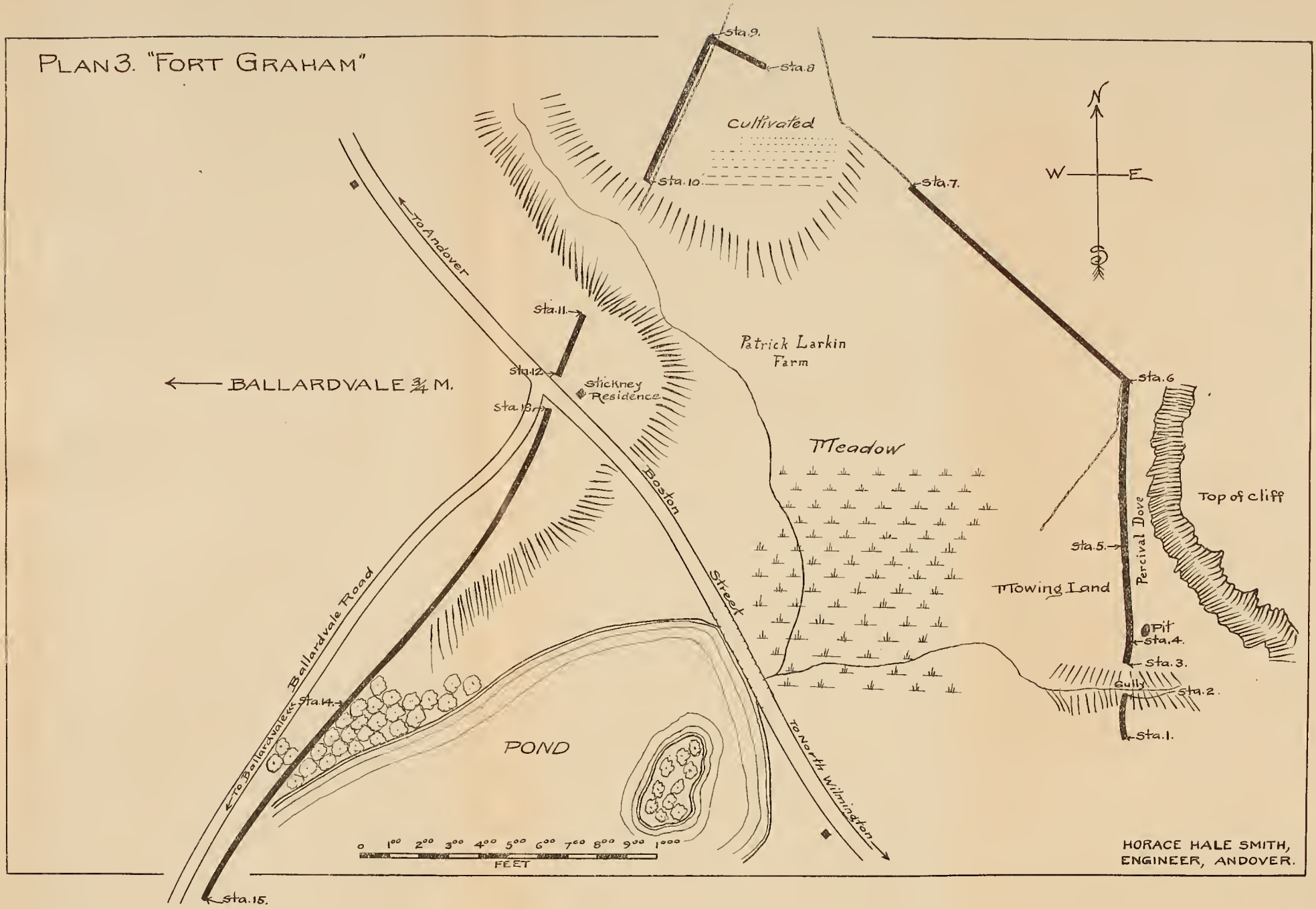
been ploughed away, and the ditch filled by cultivation. I agree with him. The soil at the point where the embankment still stands must have been poor, and the timber heavy. At any rate, for some reason this portion of the work was not obliterated by recent landowners.

Reference to the map shown in Plan II of surveys by Mr. Smith will acquaint readers with the size of space enclosed by the embankment. We assumed that the embankment extended something like four hundred feet westward and that the fourth or westward wall was perhaps longer than the eastern extension. Towards the west the land is level, but there is a slope towards the pond, (east) some hundreds of feet distant. A deep ravine, the bottom of which is forty feet lower than the fort wall, flanks the north side. There is a stream and swampy land in the bottom of this ravine.

The fact that the ends of this embankment are turned, and that all the rest of the land has been cultivated for generations is significant. It means that the present embankment owes its preservation to the fact that it was in timber. This timber has been cut off within the past few years. The rest of the embankment being in the open and at no time very high, has been ploughed out of existence. From the absence of glass beads or articles of European manufacture, I would venture the opinion that the village was pre-Colonial, and the Indians living there were not acquainted with the white settlers. Some later aborigines may have occupied the site, but there are no surface indications.

FIG. 4 — THE CIRCULAR DEPRESSION, FORT GRAHAM STATION 4 — LOOKING EAST

FIG. 5 — THE EMBANKMENT OF FORT GRAHAM STATION 5 — HEIGHT 2 FEET
Looking North-west


PLAN 3. "FORT GRAHAM"
sta.9.
sta.8
Cultivated
sta.10.
sta.7.
N
W
E
To Andover
sta.11.
sta.12.
Stickney Residence
sta.13.
Patrick Larkin Farm
BALLARDVALE 3/4 M.
sta.6.
Meadow
Top of cliff
Percival Dove
sta.5.
Mowing Land
Pit
sta.4.
sta.3.
Gully
sta.2.
sta.1.
Boston Street
Ballardvale Road
To Ballardvale
sta.14.
POND
To North Wilmington
sta.15.
0 100 200 300 400 500 600 700 800 900 1000
FEET
HORACE HALE SMITH,
ENGINEER, ANDOVER.

Part of the embankment toward the north is on the land of Mr. Percival Dove. The southern portion is owned by Mr. Patrick Larkin, and rented by Mr. Freeman Abbott.

Haggett's Pond work is of easy solution, but Fort Graham is not. The total length of embankment at Fort Graham is about 5050 feet. This does not include that section of between 900 and 1,000 feet which we cannot trace at the present time, but suppose once connected the walls. Nor does it include upwards of 600 or 700 feet of embankment which we assume existed because here and there there are traces of it. This refers to the embankment between station 1 on the map and the outlet of Foster's Pond. It is quite evident that the embankment extended in a straight line from station 1 to the brook (pond outlet). At points along this straight line referred to, we sunk pits and found charcoal and ashes in one or two places at a depth of about two feet. The old sod-line of the ditch was observed. All of this proves that cultivation of the field for an unknown length of time resulted in the embankment being ploughed down and the ditch filled. There was no ploughing at station 1 for the reason that the soil is poor and the farmers had no desire to cultivate it. The soil from station 1 to station 5 is chiefly composed of sand.

Reference to the map in Plan III will show that we can trace three sides of Fort Graham. That is, the wall beginning about 900 feet north of the outlet of Foster's Pond (dam) and running north to station 6 on the map, where it turns to the west, and is lost in a swamp (7), begins again further on and continues west until it disappears at the edge of a small pond. It is inconceivable that Fort Graham surrounded a village, for the reason that there is much low, swampy land uninhabitable; also, there is far too great an extent of territory enclosed for a New England village site. There is no evidence, absolutely none, that from the dam or outlet of Foster's Pond the embankment extended west or south-west, joining the other wall at station 15 (see map, Plan III). If the embankment ever did exist between station 1 and station 15, it has

FIG 6 — THE ROCK LEDGE FLANKING THE WALL OF FORT GRAHAM NEAR STATION 5

disappeared through cultivation or other agencies. The space enclosed, assuming that the embankment surrounded a village, is at least 2,500 x 3,000 feet, perhaps more. A village occupying such an extent of land would be easily determined because of the great quantity of chips, burnt stone, spalls, etc. occurring on the surface. Furthermore, the available ground for a village site, lying fifteen or twenty feet higher than the low, swampy ground referred to, is something like forty acres. Of this, twenty acres is sandy, dry soil, admirably suited for the location of Indian houses. Several of us accustomed to field searching went over this ground very carefully a dozen times, and all that we found was one arrow head and half a dozen chips of flint. Thinking the village debris may have been covered by accumulation of soil, or shifting sand, I had four men sink upwards of fifty pits at various points on this flat. Nothing was found in any of these excavations indicating a human habitation.

It would seem therefore, that Fort Graham was not a village site, but that the walls were erected and ditch dug for a different purpose. Whether a certain tribe wished to protect itself against the incursions of an enemy, whether the long embankments were part of a game drive, are questions I cannot answer.

A DETAILED EXPLORATION AND STUDY

Station I of the survey was established where the embankment is clearly defined. This we called the south end. Between this point and the outlet of the pond, to the south, here and there the embankment can be traced. Digging reveals that the ditch has been filled up. But as the average person cannot trace the embankment south of station I, we have not placed it on the map. Its destruction between station I and the brook is due to cultivation of the soil by white farmers. Where the embankment begins, an excavation revealed considerable charcoal and burnt earth at a depth of more than two feet. There were also a few chips of argilite and chert at this point. Continuing north, the embankment is about a foot in height, the ditch a depth varying from six to fifteen inches. After some distance, one encounters a ravine at station 2, and here a brook flows westward. The

embankment is carried down on the south side of the ravine nearly to the brook. But on the north side (station 3) the embankment cannot be traced until one is about seventy feet beyond the brook. An experimental pit sunk twenty feet south of the embankment on the north side of the brook, station 3, resulted in an interesting discovery. Apparently three feet of soil had washed down from the hill above. A large bowlder was uncovered at a depth of two and one-half or three feet. At the base of this bowlder on one side lay one hundred or more chips of chert and porphyry. These were within the space of a foot and a half, and it was clear that some Indian had sat on the edge of this rock and had chipped out implements. There was also some charcoal. Continuing north, following the embankment, at station 4 we observed to the east a circular depression in a sand knoll. This is quite extensive, being something like forty feet in diameter and six or more feet in depth when we began its excavation. At first we supposed that men had opened a pit from which they hauled away sand. But on investigation we concluded that the pit was due to Indian work. When white men dig out sand or gravel, they invariably seek a bank and work in from the side. It would be extremely inconvenient to load sand or gravel from a depression of such depth. Furthermore, there are convenient sand and gravel pits nearer the main road and these have all been worked from the side. After Mr. Graham had examined this circular depression, and another one near by, he concluded that both were of artificial and not glacial origin.

The depression referred to is about thirty feet from the fort wall and the ground about this sink hole, even up to the base of the wall, is filled with chips and spalls of stone from the Wakefield quarry, from the Marblehead quarry, and other sources of material. We collected upwards of a half bushel of flakes, etc. and saved of these some hundreds, placing them in the Andover museum. There were also found a number of arrow points and knives. The bottom of the depression was cleaned out and three feet beneath the present base we came upon pure white sand, and concluded that no Indian work existed at a greater depth than a foot or eighteen inches below the surface at this place. In trenching through from about half way up the

FIG. 7—THE EMBANKMENT AT FORT GRAHAM

Height 20 inches. The Pine Tree is large. Near Station 15.

pit toward the fort wall, one or two arrow points and numerous chips were found at some depth, but these may have rolled down the sides of the excavation when it was steeper, and have been covered up by shifting sand. That so much material should lie about this excavation, and in it, seemed strange. The thought occurred that possibly the natives roofed the pit over and made of it a place of residence. Certainly it would remain warm and dry in all seasons. Such habitations are of course rare in this part of the country and the theory may be incorrect. But it is difficult to account for such evidence of working of stone in this particular depression and hill, when there are other knolls as conveniently situated, and of the same soil.

The embankment continues over the side of the knoll referred to and on down to lower ground. At station 5 we cut through the wall and examined the ditch somewhat thoroughly. We found that the original ditch was fifteen or sixteen inches deeper than at present. Adding this earth to the embankment above, one obtains something like four feet as original height of the top of embankment from the bottom of the ditch. This should be added for the reason that it doubtless washed down from the wall into the trench. To the east, opposite station 5, is a ledge of rock rising to a height of forty feet in places. Mr. Graham suggested that this ledge constituted one of the strong objections to the supposition that a village existed to the west of the fort wall. The rocks command the entire space lying west. It would seem that instead of defending the plain, they sought to protect the hills. At Foster's Pond fort, something under a mile distant, the opposite will be found to be true when we come to study that spot.

That these ditches are along the inside of the works strengthens the theory of the Indian origin. Prehistoric earthworks of the Middle West and South have, in nearly every instance, a ditch on the inside. This is in accord with more recent progress in military science. Ditches within earthworks are observed all through the Mississippi valley. The ditch being toward these rocks and bluffs is an indication that the defenders had their camps east of the wall.

At station 6 the wall turns abruptly toward the northwest and can be followed for several hundred feet to the edge of another

brook. There are stumps of large pine trees in evidence on the wall in many places. Beyond this brook (station 7) the wall passes into very swampy ground and is soon lost. Undoubtedly this is due to the settling of the marsh for swamp lands are unstable. Be that as it may, we must leave a gap in our map, for the simple reason that we cannot follow the wall all the way to the Wilmington pike, (station 11). At station 8, in the low ground, the wall is again observed. After continuing for about 200 feet, at station 9, it turns abruptly to the south and can be traced to station 10, about 500 feet. Here it is again lost for nearly 500 feet further.

A short distance ebfore we reached station 11 there are numerous tracts of sand known as sand dunes or sand blows. Not only would nothing grow upon the sand dunes or sand blows, but their cultivation is impossible; nature, not man, here destroyed the wall. Two hundred feet north-east of the pike is station 11 and we can trace the wall to the Wilmington pike which is cut through it at stations 12 and 13. The wall extends south-west, passing down the hill and across a plain into some heavy pine timber. Here it flanks the pond and is very distinct, being nearly two feet high in places, and the ditch upwards of a foot in depth. It ends abruptly on the edge of a pond at station 15.

COMPOSITION OF WALL

The wall is composed entirely of earth, there being no stone in it, although there is little gravel in places. It is apparent that it was constructed a long time ago, for the various colored masses of earth, found in western earthworks, are not apparent. Quite likely, it was taken up in very small quantities for it is homogeneous in character.

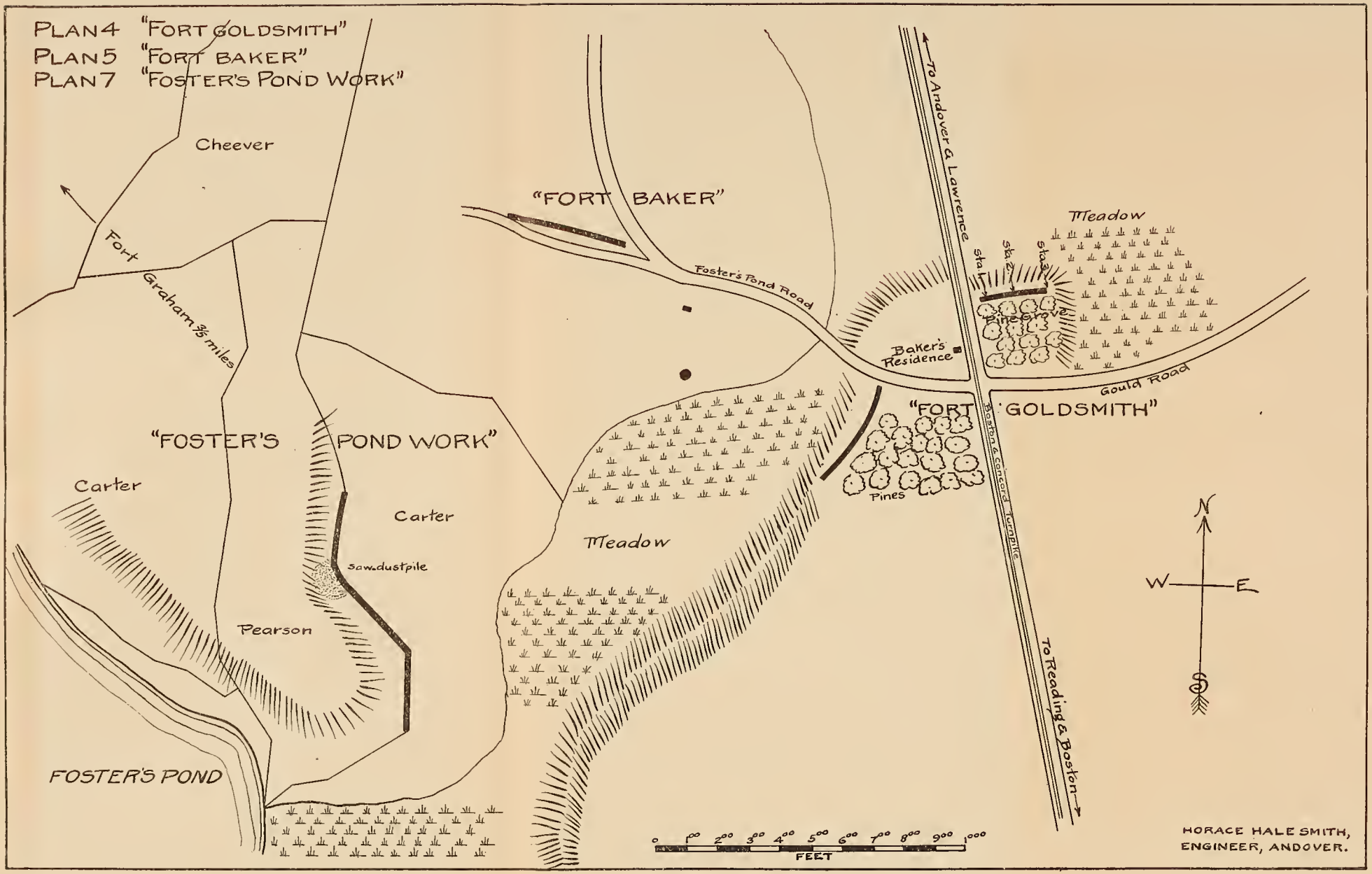
WAS IT FOR STOPPING FOREST FIRES ?

This theory has been advanced by one or two correspondents who read my article in the *Boston Transcript*. The matter has been carefully considered by several persons familiar with New England forest conditions of long ago. The wall is too big and

the ditch too deep to serve as an ordinary fire break. Moreover, the brook (now a pond) along which the wall extends for some distance, would naturally stop a fire. The Shawsheen fort follows the river for a mile and is at no place more than eighty feet distant from the water. Usually it is twenty to forty feet from the stream. As both fort and ditch are but a few yards in width and the Shawsheen varies from forty feet to upwards of two hundred, no sane person would build a wall with a view of arresting a forest fire when the Shawsheen river would perform that office much more effectively.

FIG 8 — FORT GOLDSMITH, WEST OF READING ROAD — LOOKING NORTH-EAST

FIG 9 — FORT GOLDSMITH, EAST OF THE READING ROAD — LOOKING NORTH-EAST


PLAN 4 "FORT GOLDSMITH"
PLAN 5 "FORT BAKER"
PLAN 7 "FOSTER'S POND WORK"
Cheever
Fort
Graham 35 miles
"FOSTER'S POND WORK"
Carter
Carter
sawdustpile
Pearson
FOSTER'S POND
"FORT BAKER"
Foster's Pond Road
Meadow
Meadow
Baker's Residence
To Andover & Lawrence
sta 2
sta 3
Pines
Gould Road
"FORT GOLDSMITH"
Boston & Concord Turnpike
Pines
To Reading & Boston
N
W
E
S
0 100 200 300 400 500 600 700 800 900 1000
FEET
HORACE HALE SMITH,
ENGINEER, ANDOVER.

FORT GOLDSMITH

On the estate formerly owned by Mr. W. G. Goldsmith and on adjoining lots owned by Mr. Perkins and the Baker estate are two earthworks similar to Fort Graham but not so large. The character of these is clearly shown in Mr. Smith's survey maps numbers IV and V. It will be observed that the extreme end of Fort Goldsmith lies east of the Andover, Reading and Boston turnpike. From the edge of the turnpike to the eastward, the embankment can be traced for 210 feet. The embankment is somewhat different from Fort Graham in that it follows the edge of a ravine, being placed something like 15 to 20 feet down the slope from the plateau above. This slope is rather abrupt, and the bottom of the ditch must be nearly seven feet lower than the plateau above. There is a heavy growth of small pine timber on this lot and the surface is fairly flat. The ravine to the north, is rather precipitous. The embankment instead of following the edge of this ravine, as in case of earthworks in the Ohio valley, has been constructed some little distance down the slope as stated above. The ditch here is on the upper side, which would indicate that if the work is at all defensive, the natives responsible for its building were seeking to defend the plateau referred to. Not far from the eastern end of the embankment is a swamp, and farther along in the same direction a fine spring. When the weather permits, next April, it is our intention to excavate near this spring and at several points on either side of the walls of Fort Goldsmith. Up to the present, no excavating has been attempted here.

To the west of the turnpike and the Bay State Street Railway, the embankment cannot be traced for some 350 feet. This is because a house, chicken yard and small stable are in evidence and as a consequence the embankment is probably obliterated. To the southwest of the house the wall begins again. Reference to the map, Plan IV, will make clear to readers these points. Here it follows the edge of the hill, curving gracefully towards the south-west where it ends abruptly. The hill at this point may be properly called a ridge, and there is a deep depression to the south; not a plateau, as in the case of the eastern

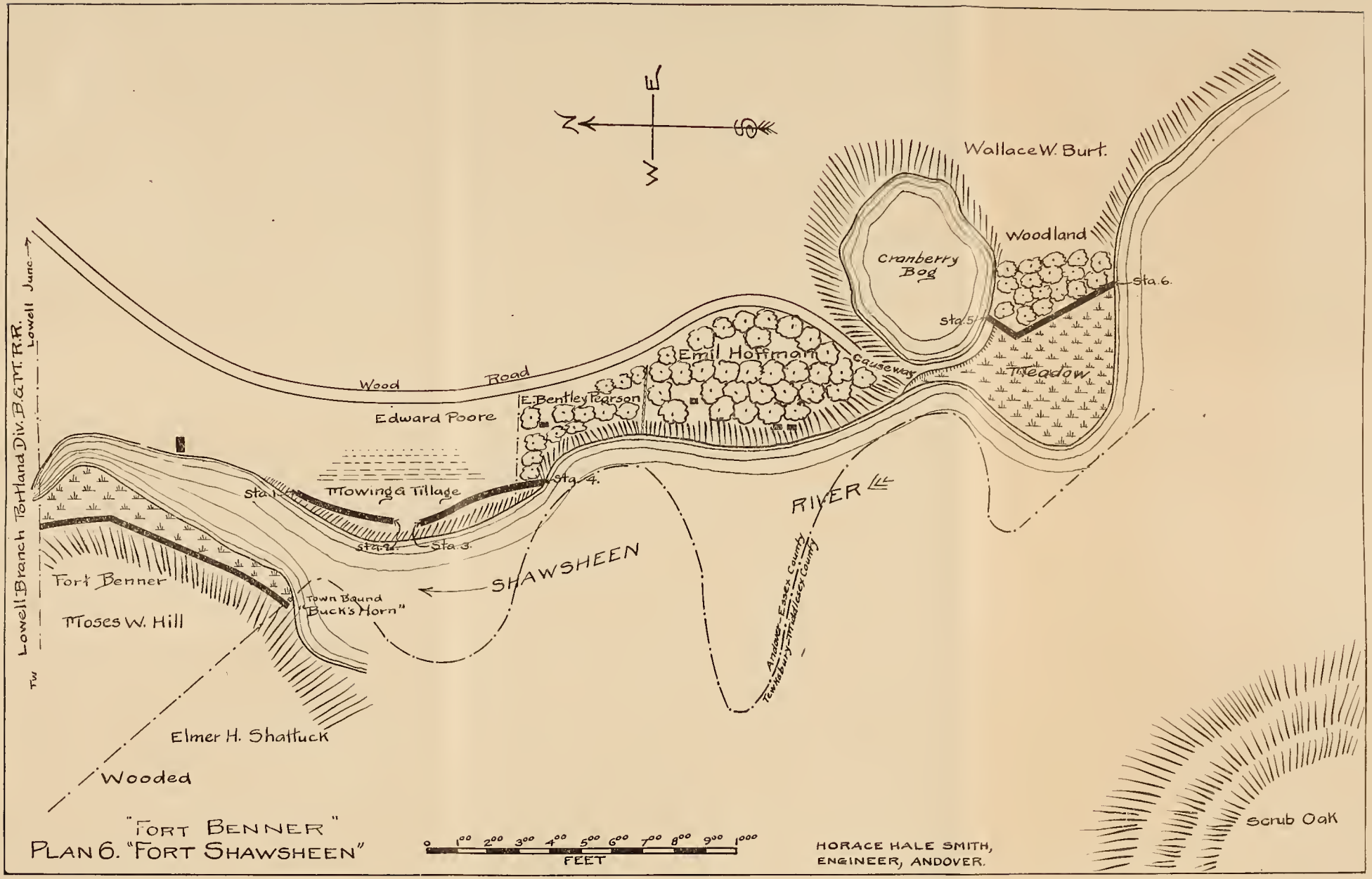
FIG 10 — THE FOSTER'S POND WORK — LOOKING WEST

extension of Fort Goldsmith. The theory at once suggests itself that in the depression was a winter camp of Indians and that the wall was crowned with palisades to protect such a village. As against this theory it is quite proper to record the unusual location of such a village, part being on the plateau and the remainder in a deep depression.

The embankment, composed entirely of earth, varies from eighteen inches to three feet in height. At the point of greatest contrast it is four feet from the bottom of the ditch to the top of the wall, (near station 1), and originally the contrast must have been something like six feet. Fort Goldsmith, east of the turnpike, and Fort Shawsheen present the clearest defined embankments and ditches. The works at Haggett's pond and Fort Graham are not so well preserved.

West of Fort Goldsmith there is another embankment extending along the crown of a gently sloping ridge on or near the Baker estate land and known as Fort Baker. This is not quite so prominent in places as the others, yet can be clearly defined and followed throughout its length of 400 feet. See Plan V.

FIG. 11 — THE SHAWSHEEN FROM FORTS BENNER AND SHAWSHEEN — LOOKING UP STREAM



"FORT BENNER"

PLAN 6. "FORT SHAWSHEEN"

HORACE HALE SMITH, ENGINEER, ANDOVER.

FORT SHAWSHEEN

Here we have a work which is interesting in that it follows the bank of the river, as has been previously stated, for nearly a mile, south or south-west of station 1. It is shown in plan VI. The point at which it begins is not far from a large brick building or factory. The land is owned by various persons who have small camps along the river, which is quite picturesque at this place.

This embankment is splendidly preserved and is clearly traced and easily found, for the wall begins about one-fourth of a mile beyond Lowell Junction station. At station 4 the embankment ends abruptly at the edge of the river. Between stations 4 and 5, a distance of 1600 feet or more, the embankment cannot be traced. Yet one naturally supposes that the embankment did exist at one time between stations 4 and 5. It is possible that there are some embankments on the higher ground back from the river, toward the east, but so far we have not been able to find other embankments.

At station 5 the embankment begins again at the south end of an old dam, on the edge of a swamp, and after extending something like 500 feet, ends abruptly at the edge of a deep eddy in the Shawsheen. As in the case of other embankments, the line is quite straight and there is no evidence at either end that the walls have been turned. Thus it is different from the work at Haggett's Pond which we are sure surrounded a village. Aside from prominence of the wall at Fort Shawsheen the ditch is on the average deeper than in the other works. The ditch is on the side away from the river, thus indicating that natives who occupied the place wished to defend the land to the south, from an enemy coming up or down the river, or approaching from the north, beyond the stream. These arguments apply, of course, if the work is defensive in character.

Fort Shawsheen has not been thoroughly explored, and as was stated in the beginning of this BULLETIN, all of our examinations are preliminary. No excavations have been attempted in the embankments or ditch. But one of our workmen was ordered to spend fifteen or twenty days in searching

FIG. 12 — FORT SHAWSHEEN — LOOKING NORTH-EAST

Near Pierson's Camp

the surface of fields not only about Fort Shawsheen but near the other enclosures. His work resulted in the finding of great quantities of chips, flakes, etc. such as commonly result from the manufacture of implements. There are attractive knolls along the Shawsheen and on not a few of these, summer camps have been erected by persons who live in nearby towns. It is about these knolls that most of the evidences of chert and argilite chipping occur.

Fort Shawsheen indicates to my mind that these works were not constructed by early white colonists. It is evident that the Shawsheen river would act as an effective barrier in case of forest fires and therefore the embankment would not be erected to arrest such conflagration. In addition to this theory that these walls were constructed to prevent fires from spreading, the more plausible solution has been volunteered that these were erected to mark boundaries of farms in early times. At first we thought that this might be the correct explanation of the works, but Fort Shawsheen and the western extention of Fort Goldsmith are entirely too large to serve for such purpose. Moreover, when the country was first settled, trees were frequently blazed to indicate boundaries, and later not only were stones set up as marks, but stone walls were speedily constructed as the country became settled. The stone walls do not follow these embankments and at Fort Graham, where the embankment at two points forms a boundary between the land of different owners, a stone wall follows it but a short distance. Where walls have existed for a great length of time and have been removed, there is a small elevation or ridge to be observed, but there is no ditch.

Furthermore, while a wall may leave a slight ridge yet it is not to be compared, as to size, with the walls of the places shown in our maps.

Small fields, cultivated for generations here in New England, present an interesting study when compared with the embankments. Particularly noticeable are ridges about the edge of fields where the ploughing has followed the same direction year after year. This tends to move the earth to one side of the field and if the furrows are run the same way each year, it banks up along the edge of a wall. Such a place is Carter's Hill,

FIG. 13 — THE WALL AND DITCH OF FORT SHAWSHEEN — LOOKING NORTH-WEST
Near Pierson's Camp

the home of the late Mr. Charles L. Carter. Mr. Carter's beautiful estate is on one of the high hills about half a mile east of Phillips Academy. At first we supposed that the embankment on his hill was due to Indian occupation. But Mr. Willoughby was inclined to the opinion that the small wall of earth surrounding several acres, is the result of continuous cultivation, the furrows being turned the same way. I am willing to accept his conclusion. It is just possible that the earthwork on Carter's hill is Indian, but the evidence would tend to indicate that it is not, and the walls are very small as compared with the others. We dug a number of pits on Mr. Carter's place, but found nothing — no flint chips, no charcoal.

The forts Shawsheen and Goldsmith, and portions of Fort Graham are where cultivation would be improbable if not impossible. Therefore, these are not to be placed in the same category with the embankment on Carter's Hill. At Fort Goldsmith the embankments follow the backbone or the edge of ridges, as previously explained, and therefore they could not have resulted from ploughing.

FORT BENNER

After this report had been put in type, Mr. Allen R. Benner, Professor of Greek in our Academy, called my attention to an embankment on the north side of the Shawsheen river. Mr. Benner had discovered this during one of his canoe trips up the Shawsheen recently. I immediately visited the place and found an embankment and ditch over 600 feet in length. The embankment is the highest, and the ditch the deepest of any of the works herein described. It is also more massive than the embankments at Millis. Mr. Smith made a survey, but the exploration of this interesting place will be deferred until next spring, when a more thorough investigation is to be carried on at all of these earthworks. Meantime, it is well to state that Fort Benner, as we have named the place, lies across the river from Fort Shawsheen. The upper end of Fort Benner is about opposite the lower end of Fort Shawsheen. It is quite possible that there was a village on the tongue of land protected by this embankment. The river makes a bend here, and there is a little sandy plateau back of the fort which appears as if it were a favorable place for an Indian encampment.

FIG. 14 — MASS OF FELSITE, QUARTZITE AND OTHER FLAKES FROM FORT GRAHAM. STATION 5
S. about 1-4

FIG. 15 — KNIVES AND PROJECTILE POINTS OF FELSITE, QUARTZITE AND WHITE QUARTZ

Fort Graham S. 2-3

FOSTER'S POND WORK

One of the strangest of these works is the one at Foster's Pond. Here the ditch is deeper than at any other point in the several works examined, but the wall is not quite so prominent. Whereas, the other works are on high ground for the most part, the Foster's Pond Fort is for the greater part in a low and swampy place. In fact, it extends over soft, wet ground for some distance. Then the wall continues over a gentle hill and terminates at the edge of a good-sized pond. This pond has been formed in historic times by mill owners placing a dam some distance away in order to obtain water power. However, before the dam was constructed, the land was low, the place swampy, and a sluggish brook meandered through what was then a broad valley.

To me, the Foster's Pond earthwork is more of a puzzle than any of the others. At Fort Graham the ditch is on the side flanking the high bluffs to the East, and the supposition is that the natives were protecting themselves against attack from the plain beyond. At Foster's Pond the embankment is toward the high land westward, and the ditch on the low side toward the swamp, this would indicate that the natives were holding the swamp or low ground. If so, the attacking party would have no difficulty in throwing arrows from the high ground far over and beyond the supposed defensive works. But the ditch here is much deeper than elsewhere, and the persons holding the fort would be under ample protection.

Foster's Pond work serves to mystify us the more as the conditions are exactly reversed from those found at Fort Graham.

We apply the word Fort in describing these places, although it is difficult for us to conceive how the works could have been of any particular value. They are so extensive that it would require a large number of men to maintain them. Furthermore, there is no evidence of considerable population in or about any of these places.

Several persons have mentioned the question of drainage. This can be dispensed with easily as the works are found at various elevations and angles, and the supposition that they would be of any service in draining lands is preposterous.

CHARACTER OF IMPLEMENTS FOUND

Several of us spent considerable time searching the fields where these earthworks are located, and also the adjacent land thereto. Little of consequence was discovered, and I sent Mr. Walter Stickney on a collecting tour throughout the entire region. He spent thirty or forty days in careful search of both high and low land, cultivated fields and "sand blows". The latter are favorite places among collectors in this part of New England, as the sand blows away and leaves stone objects exposed. In all of the field searching, less was found than we recovered in excavations at the circular depression near station 4 of Fort Graham.

The illustrations presented in this pamphlet show the various implements discovered. I am indebted to Professor H. W. Haynes of Boston for identifying the materials of which these are made.

The materials from Fort Shawsheen are Wakefield felsite, also quartzite and slate.

At Fort Graham the stone found is green felsite of the Melrose quarry. There is a beautiful green hornstone in evidence, but the locality whence it came is not known. The Wakefield felsite and quartzite are common.

Professor Haynes says: "I have found the Wakefield felsite to be the stone most plentiful in all sites north of the Charles River, and it shows various colors of patination."

The implements themselves are not different from the average types found in New England, and need no explanation. But I would call attention to the predominance of the triangular or "war point." More of these were found than any others. It is also to be observed that the implements are very rude and rough. There is no evidence of any considerable skill in their manufacture.

FIG. 16 — CHIPPED IMPLEMENTS, FORT GRAHAM
S. 2-3

FIG. 17 — MATERIAL IN PROCESS OF MANUFACTURE
Fort Graham S. 1-2

HISTORICAL REFERENCES TO INDIAN FORTS

In our multitudinous historic works dealing with the Indians of the East there are references to various rude barricades made of logs, brush, or earth, and employed at various times in the historic period when the Indians were fighting among themselves or against the Whites. Some of these, however, give a few details as to the embankments and ditches.

I am indebted to Mr. Roland G. Hazard for a copy of his oration delivered at the unveiling of the monument commemorating the Great Swamp Fight of December 19th, 1675. This little volume presents a brief history of the famous fight and contains a bibliography of matters pertaining to the Narragansett country.

I wrote to Mr. Hazard for further information, and he informed me that the fort wall has been nearly obliterated by ploughing, but is in places still two feet high. The following taken from page 32 of a recent publication, is of interest:—

"After marching through the deep snow many weary miles, in the words of a contemporary writer: 'About Noon, they come to a large swamp which, by reason of the frost all the night before they were capable of going over (which else they could not have done). They forthwith in one body entered the said swamp and in the midst thereof was a piece of firm land of about three or four acres of ground whereon Indians had built a kind of fort, being palisado'd around, and within that a clay wall, as also felled down abundance of trees to lay quite around the said fort, but they had not quite finished the said work.'" *

The following reference taken from the "Hand Book of American Indians" (page 471), will suffice.

"The fortress built by King Philip in the swamp at South Kensington, R. I., consisted of a double row of palisades, flanked by a great abatis, outside of which was a deep ditch. At one corner a gap of the length of one log was left as an entrance, the breastwork here being only four or five feet high; and this pas-

* *A Record of the Ceremony and Oration, on the Occasion of the Unveiling of the Monument Commemorating The Great Swamp Fight, December* 19, 1675, *in the Narragansett Country, Rhode Island.* Rhode Island Society of Colonial Wars, Boston, 1906.

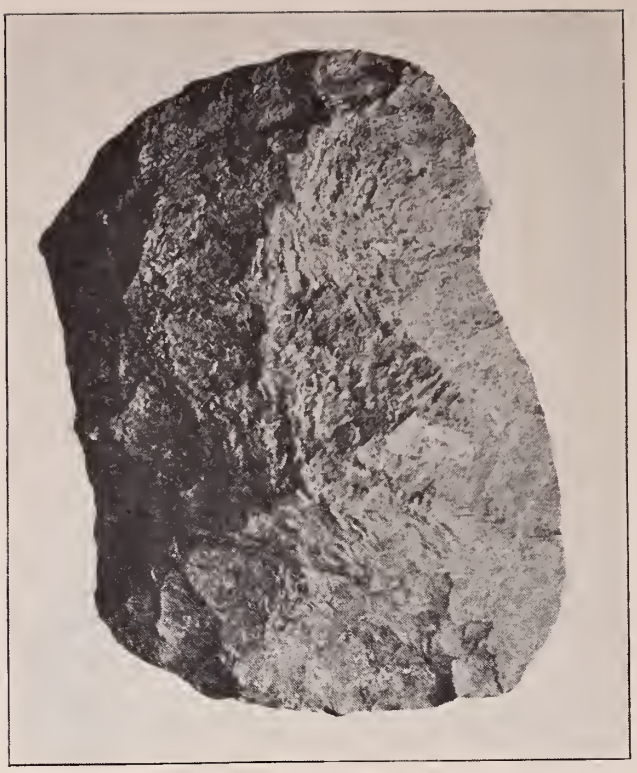
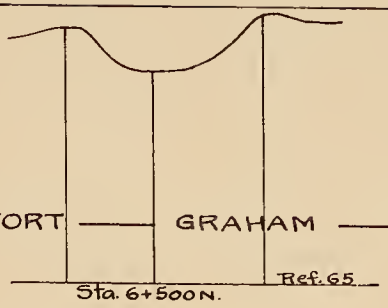
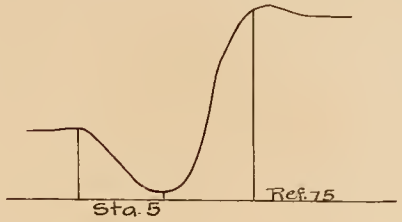
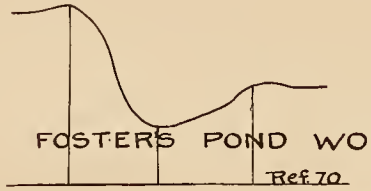


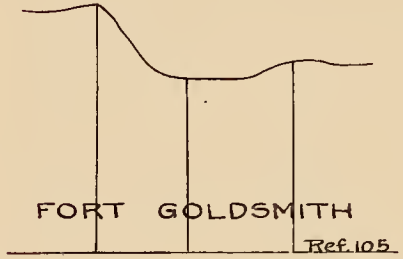
FIG. 18 — CHIPPED OBJECT. USE UNKNOWN
Fort Graham S. 1-1

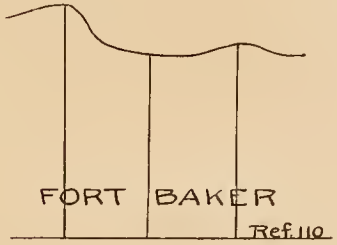
FIG. 19 — SANDSTONE AND TRAP OBJECTS
Ends Rubbed Smooth. Fort Graham
S. 1-1

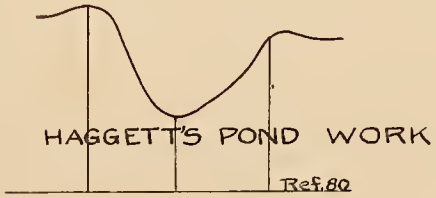


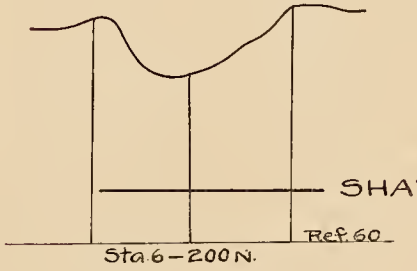


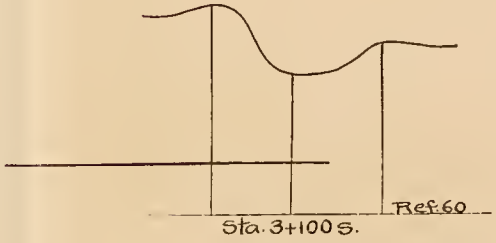












CROSS SECTIONS

PLAN 8

0 1 2 3 4 5 6 7 8 9 10
FEET

HORACE HALE SMITH,
ENGINEER, ANDOVER.

sage was defended by a well-constructed blockhouse, whilst the ditch was crossed by a single log which served as a bridge."

In the "American Anthropologist", Volume VIII, (1906) pages 115-132, Mr. Charles C. Willoughby presents an able paper entitled "New England Houses and Gardens." Some of the pages of this paper are devoted to forts. The paper indicates a great deal of reading on the part of Mr. Willoughby and he cites some twelve or fifteen authorities as to the use, the construction and the character of Indian forts in New England. I suppose that his investigations led him to cover the ground thoroughly, so far as historic fortifications or enclosures are concerned. If this is true, it is interesting to note that the kind of forts or enclosures referred to by these many authorities are much smaller in extent that the walls and ditches of the seven forts described in this pamphlet. The fort of the Penobscot Indians mentioned by him was 70 x 50 feet; "that of the Pequots in south-eastern Connecticut, enclosed about an acre of ground and contained sixty or seventy wigwams." This was circular. "Phillips fort was on elevated ground three or four acres in extent in the middle of a hideous swamp."

It will thus be seen that the colonists refer to much smaller and different earthworks from the kind we have surveyed and described.

In his description of the gardens and cultivated fields of Indians Mr. Willoughby quotes from the records of the explorer Champlain. Champlain observed some trenches in the sand on the slopes of hills and in these the Indians placed corn and removed the commodity as needed. Champlain stated that three or four feet of earth was placed over the deposit and the corn was in large grass sacks. Corn might have been stored in a short trench or circular pit but it is not probable that the natives of this part of New England would dig upwards of three miles of trenches* and flank same with a continuous ridge, for the purpose of storing corn. The amount of corn that could be placed in the trenches of these seven forts would exceed in quantity, it is safe to assume, that possessed by the entire Indian body of Massachusetts during two of their most prosperous agricultural seasons.

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* Andover and Millis works combined.

FIG. 20 — AXES (BROKEN) FOUND IN FIELDS NEAR FORT GRAHAM BY WALTER STICKNEY S. 1-2

While I do not myself believe in this theory, yet to be fair to all concerned and include every possibility, it should be mentioned. The late Professor E. N. Horsford was a firm believer in the supposition that the Norsemen once settled near Boston and left various remains along the Charles River and at other points.

Professor Haynes has kindly looked up the various references pro and con and sent me numerous citations from Professor Horsford's published articles. I cannot go into this subject at length here, but intend to thoroughly examine the so-called Norse remains before publishing the complete account of these New England earthworks.

That Horsford found strange and unexplained embankments, no one will deny. Especially is this true of the long wall and ditch at the junction of Stony Brook and the Charles River. Mr. Willoughby told me that he was not prepared to say that the Stony Brook work is Indian. It does not appear to be Indian to me, yet what purpose it would serve the Whites of the Colonial period, is open to question.

In studying the Norse theory as to origin of these places, one must remember that Norsemen did not use stone tools, but employed iron and other substances for their weapons. These would totally disappear in this climate and leave not a trace. Also, if their houses were of wood — and that was more convenient than stone — these had vanished long before the settlement at Plymouth Rock. We must look for their graves, etc., if we would secure evidence. Also, their inscriptions.

Readers may be interested in the various reports and articles Professor Horsford published. I present three of the titles: — "The Discovery of the Ancient City of Norumbega," 1880; "The Problem of the Northmen," 1889; "The Defenses of Norumbega," 1891.

It would seem that Professor Horsford thought there were quite a number of Norsemen here, and that they became merged with the Indians. Whether one inclines to his opinion or not, one must admit that Horsford spent a great deal of time in searching not only the sites, but also the Sagas, the records and the history

of the people he was persuaded were responsible for the erection of these curious embankments.

As to what service these earthworks would be to Indians, I leave to others to decide, as stated earlier in this pamphlet. But I would like to suggest that it is my conviction that these earthworks are very old. They do not appear to be recent. Whether they were erected at a time when there was a considerable Indian population in New England, it is impossible to say with certainty. As they are not very large (compared with Western earthworks) it is not beyond the power of one or two thousand Indians to have constructed all of them within a period of a few weeks, during the summer or fall when digging was comparatively easy. Our forts may have been thrown up in anticipation of an attack, and the attack did not occur. If such an attack had occurred, and there were large numbers of natives on each side, we would find the usual chert and stone implements of warfare. It is not conceivable that they could have been constructed by a few Indians, for the embankments are too extensive. A small band would not need upwards of three miles of embankment to protect itself.

If these works had been inhabited when the colonists were here, our forebears would certainly have referred to the fact. They mentioned numerous villages and forts in other places. But the log and brush forts of the historic Indians — even including the small embankments and ditches — are not to be compared with Shawsheen, Graham, Goldsmith or Millis. Shall we say that these are not defensive works?

No one at all familiar with Indian remains can affirm truthfully that these are modern. I have already commented on the dearth of village site material everywhere noted save at Haggett's and Millis.

Millis may have been a fortified village; at least a part of it. The land is better suited to wigwam locations and the pond looks as if it was a good place for trapping or wild-fowl hunting in ancient times. The Charles River is near at hand, and travel by canoes to the ocean shore was feasible.

Professor Henry W. Haynes examined Forts Graham and Goldsmith. He considered them quite puzzling, but inclined to the opinion that they are of Indian origin.

FIG. 21 — AN "ANVIL" OR UNKNOWN STONE AND A GROOVED AXE

Found by Singleton Moorehead near Pomp's Pond S. 1-2

It is just possible that the tribes living along the Merrimack River — for most of our eastern Massachusetts Indians resided near or on that river or along the coast — feared a general attack from a powerful enemy. They retreated to the Foster's Pond region inland, and up the Shawsheen and constructed these works; but the works were not occupied for any length of time. Thus we have another supposition.

Having offered all the explanations which first suggest themselves, and finding none of them entirely satisfactory, one resorts to the final theory that possibly they are not defensive in character at all. It is quite likely that we have not solved their true purpose. They may have been constructed to turn the game in a desired direction during some great game drive. Against this supposition there is to be considered the dearth of information to the effect that the New England Indians engaged in game drives on a large scale. I do not think that the idea of game drives appeals to one except in the case of Fort Shawsheen. Here, the long embankment, crowned with logs or heavy brush would keep the game within a confine twenty to sixty feet wide for a distance of nearly a mile. Game attempting to swim the river could be easily captured or killed.

However, I do not claim that the works were constructed for either of these purposes. It will require a great deal of study, research, and exploration to solve the riddle presented us Beyond question it is no easy task to interpret these places. That they meant something of consequence to the aborigines is self evident. That they should occur here in New England where so few Indian remains of magnitude have been found, is both surprising and important. That these seven works and the one at Millis are not easy of solution renders them all the more interesting to archaeologists, and we should bend our energies towards obtaining more light upon the purpose of their construction.

CONCLUSIONS

In the foregoing pages I have commented on the various theories as to these earthworks. Little remains to be said. We may sum up our observations thus: —

First; Forts Graham, Goldsmith, Baker, Shawsheen, Benner, Haggett's and Foster's Pond were not constructed by white people to control forest fires.

Second; they are not boundaries of lands.

Third; they were not for purposes of drainage.

Fourth; they were not built by the Whites during the Colonial or French and Indian wars.

Fifth; they are supposedly of Indian origin.